

Office Action Summary

Application No.

10/691,347

Applicant(s)

ZHAO ET AL.

Examiner

Nhan T. Tran

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,13-17,20-24 and 27-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,13-17,20-22,24,27-29 and 31 is/are rejected.
- 7) ☒ Claim(s) 23 and 30 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 8/17/2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of the full statutory term of U.S. Patent No. 6,727,946 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

2. Applicant's arguments, filed 8/17/2007, with respect to the rejections of claims 1, 13-17, 20-22, 24, 27-29 & 31 in view of Wu et al. have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Pain et al. (US 6,721,464).

Claim Objections

3. Claim 1 is objected to because a **comma** is required after "wherein during the pull down function". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 13-17, 20, 24, 27 & 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Pain et al. (US 6,721,464).

Regarding claim 1, Pain discloses an active pixel sensor circuit (Fig. 11B and col. 2, lines 40-47), comprising:

a sensor (photodiode PD) for producing a sensor potential (Fig. 11B and col. 6, lines 61-64);

a pull-down circuit (whole circuit 1150 in Fig. 11B) for implementing a pull down function during which the sensor potential is pulled down below a selected critical level (Fig. 13 and col. 6, line 61 – col. 7, line 25, wherein the sensor potential is pulled down to a hard-reset level by virtue of the hard-reset);

a reset voltage line (Fig. 11B) coupled to the pull-down circuit; and a reset transistor (the transistor connected to RST line) coupled between the reset voltage line and the sensor (PD), wherein during the pull down function, the reset transistor is conducting and the pull-down circuit operates to pull down the sensor potential below the selected critical level (see Fig. 13), the pull down function being performed prior to a reset function (a soft-reset) when the sensor potential is reset to a selected level (see

col. 7, lines 5-25, wherein the reset function is considered as the soft-reset function which is subsequently performed after the hard-reset function).

Regarding claim 13, it is clear in Pain that the sensor comprises a photodiode (PD in Fig. 11B, see claim 1).

Regarding claim 14, Pain also discloses that the selected critical level is determined according to the potential at which the reset transistor will be on when the reset function (soft-reset) starts (see Fig. 13 and col. 7, lines 5-25).

Regarding claim 15, it is also seen in Pain that the timing of the pull down function is such that the sensor is stabilized at a level below the selected critical level before the reset function starts (Fig. 13 and col. 7, lines 5-25).

Regarding claims 16 & 17, these method claims are also met by the analyses of claims 1 & 15, respectively.

Regarding claim 20, it is also seen in Pain that the sensor is coupled through a plurality of transistors to a bit line (pix-out in Fig. 11B), and the bit line is used (in general) to pull down the sensor potential (Figs. 11B-13 and col. 6, line 61 – col. 7, line 25).

Regarding claim 24, Pain discloses an active pixel sensor circuit in which a soft reset function is performed (Figs. 11B-13 and col. 6, line 61 – col. 7, line 25), the active pixel sensor circuit comprising:

a sensor (photodiode PD) which outputs a sensor potential (Fig. 11B and col. 6, lines 61-64);

a reset transistor (the transistor connected to RST line) coupled to the sensor; and a bit line (pix-out) coupled through a plurality of transistors to the sensor, wherein the sensor potential is pulled below a selected critical level (by virtue of hard-reset) prior to the time when a soft reset function is performed to reset the sensor potential (see Figs. 11B – 13 and col. 6, line 61 – col. 7, line 25).

Regarding claims 27 & 31, these claims are also met by the analyses of claims 20 & 14, respectively.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 21-22, 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pain et al. (US 6,721,464) in view of Krymski (US 6,917,027).

Regarding claim 21, although Pain teaches the bit line as discussed in claim 20, Pain does not explicitly disclose that a loading transistor is coupled to the bit line, and the voltage potential on the bit line is pulled down by increasing bias on the loading transistor.

However, it is well recognized by Krymski in Fig. 1 that the bit line (125) is coupled to a loading transistor (130, col. 2, line 23), wherein when the loading transistor is turned on by increasing the gate voltage at v_{ln} , the voltage potential on the bit line is pulled down to V_{ss} (i.e., ground).

Therefore, it would have been obvious to one of ordinary skill in the art to configure the pixel circuit in Pain to include a loading transistor coupled to the bit line for pulling down the potential of the bit line by increasing the bias on the loading transistor so as to filter kTC noise as taught by Krymski, col. 1, lines 43-44.

Regarding claim 22, Pain in view of Krymski also teaches a biasing circuit (indicated by v_{ln} in Fig. 1 of Krymski), and the biasing circuit is used to increase the bias on the loading transistor.

Regarding claims 28 & 29, these claims are also met by the analyses of claims 21 & 22, respectively.

Allowable Subject Matter

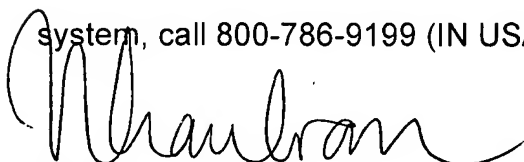
6. Claims 23 & 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Tran whose telephone number is (571) 272-7371. The examiner can normally be reached on Monday - Friday, 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


NHAN T. TRAN
Patent Examiner